

Remarks

Reconsideration of this application is respectfully requested in view of the foregoing amendments and the following remarks. Claims 1-11 and 14-20 are pending in the application. Claims 12 and 13 have been canceled. No new claims have been added, so it is believed no additional fees are required.

The title has been amended in an effort to comply with the examiner's requirement to make the title more descriptive.

The specification has been amended on page 2 to update the status of a cited prior U.S. patent application.

Claims 1-4, 8-15 and 17 were rejected under 35 U.S.C. 102(b) as being anticipated by *Laor*. Figure 4 of *Laor* shows a ferrule 32 with radially distributed access apertures 30. The ferrule has a central bore for receiving an optical fiber 36. The drawings and description suggest that the fiber comprises only a light-transmitting core, with no jacket layers. Viscous soldering material is forced into the bore through the access apertures to secure the core in the ferrule. The access apertures are illustrated as being conical or funnel-shaped at an outer wall of the ferrule and narrowing to very small-diameter passage communicating with the bore. This is because the solder is injected under pressure (please see column 4, lines 5-11).

Applicant's independent claim 1 has been amended to recite that the cavities in communication with the interior conduit of the ferrule have a larger cross-sectional area than the passages connecting the cavities to the outer wall. The inner wall of the ferrule is now recited as being sized to snugly receive an outer jacket layer of a fiber optic cable end. These features are not shown by *Laor*, so applicant believes claim 1 and its dependent claims are not anticipated by *Laor*. The *Laor* patent teaches structure and function actually opposite to the present invention. The *Laor* access apertures significantly narrow in width to keep the solder under pressure. The access apertures are wider at the exterior of the ferrule to presumably guide the solder into the pressure passage with a minimum amount of spillage. The ferrule bore is only large enough to receive a fiber core and surrounding solder. Applicant therefore believes it would not be obvious to modify *Laor* for a hindsight reconstruction of the invention defined in the claims. *Laor* is not intended to accommodate a jacketed fiber and is not intended to allow passage of a laser through the access apertures. Modifying the *Laor* ferrule to include the limitations of amended claim 1 would destroy its ability to operate in the manner intended.

Furthermore, with regard to claim 4, there is no evidence, inherent or implied, that the *Laor* access apertures make a four leaf clover as alleged by the examiner. Such a design provides a unique, reliable attaching feature for the outer jacket layer of the cable, and the *Laor* ferrule is not meant for use with a jacketed cable end and cannot be reasonably used with a laser.

Applicant's dependent claim 10 and independent claim 11 have been amended to better recite the features inside the ferrule allowing the invention's unique cable attaching

function. In the case of claim 11, this has been done by combining dependent claims 12 and 13 with claim 11 and including more specific language. An interior conduit is defined by the inner annular wall, the inner annular wall is sized to receive an outer jacket layer of the cable, the cavities are open to the conduit, and the inner annular wall is connected to a conical wall that converges to a narrower channel sized to receive the core of the cable. These features are clearly recited in terms of structure, the language has antecedent basis in the specification, and the features are not taught or suggested by *Laor*. Figure 4 of *Laor* shows a single section with a constant diameter bore sized wide enough only to receive a fiber core. The bore widens only at the very end of the fiber core and ferrule. The examiner says that this conical wall aligns a core of the fiber optic cable. But the conical wall does not contact the core, *Laor* does not appear to even mention the conical wall, and *Laor* states that it is the amount of inserted soldering material that determines the transverse orientation of the fiber relative to the longitudinal axis of the bore (column 4, lines 5-11).

Claims 5-7, 16 and 18-20 were rejected under 35 U.S.C. 103(a) as being unpatentable over *Laor* in view of *Omiya et al.*

The *Omiya* patent discloses a sleeve 1 for connecting and aligning opposed ferrules 10. The sleeve has a tubular body 2 with inner ridges 3. There is a slit 4 that provides elasticity for repeated use of the sleeve. There are no passages through the body of the sleeve. There are no passages or cavities in the ferrules 10, only a bore 14 for receiving a sheathed portion 16 of the fiber and a bore 13 for receiving the fiber 17. An adhesive agent is applied on the fiber to hold it in the ferrule. A laser is not used.

Applicant has amended independent method claim 18 to recite that the ferrule is formed with a “cavity facing a hollow interior of the ferrule and a passage extending from the” cavity to an exterior of the ferrule. A laser is directed through the passage to heat the outer covering of the fiber until it melts and expands into the cavity. Antecedent basis for this language appears on page 8 of the specification, lines 6 and 7.

The examiner states that “laser is the most widely used apparatus for welding.” But neither *Laor* nor *Omiya* disclose the use of a laser, and both teach methods for securing the ferrule to the cable which have no need or way to use lasers. The examiner appears to mainly cite *Omiya* for providing “rounded edges on the clover, cavities having oval shapes... passages smaller than cavities.” This is difficult for applicant to understand. Applicant honestly cannot find these features in *Omiya* and respectfully requests that the examiner more specifically point out their locations. Perhaps the roundness at the peaks of the *Omiya* ridges 3 would not damage the cable, but they don’t come into contact with a cable. How does this relate to claimed cavities into which the jacket of the fiber melts and expands? As depicted by *Omiya* Figures 3 and 5, a jacket layer of a fiber is not meant to melt and expand between the ridges. Only the ceramic or metal ferrules 11 contact the ridges. The ridges are meant to help align the axes of the ferrules (column 8, line 66), not hold a fiber in a ferrule. In claim 18, using the laser to melt and expand the covering into the cavity is a method step and should be given patentable weight. Applicant can find no hint of this process in *Laor* and *Omiya*, and there is no need or purpose for modifying either disclosure to include this feature.

The prior patents made of record and not relied upon also do not disclose the features of the claimed invention.

Applicant thinks this amendment is a complete response to the examiner's rejections and places the application in condition for allowance. Notification of such action is respectfully requested. The examiner is invited to contact applicant's agent at the telephone number indicated below if the examiner has any questions or concerns, or suggestions that would advance prosecution of this case.

Respectfully submitted,



Daniel R. Edelbrock

Agent for Applicant

Registration No. 32,691

Phone: (734) 983-2158

Fax: (734) 983-2159

6801 Haggerty Road, 2632E

Canton, Michigan 48187

Dated: 12/21/2004